IRIS.

Ephemeris at her Reappearance, 1848. By Mr. Hind.

"The following ephemeris of this planet up to November 11, is founded upon elements calculated from the observations at Mr. Bishop's Observatory on August 13, 1847; Dr. Wichmann's with the Königsberg Heliometer, on November 7; and Professor Challis' latest observation, 1848, February 17. The observed positions were corrected for aberration and parallax; but the effect of planetary perturbations on the geocentric place during the interval, being very minute, has been neglected.

Epoch 1847, August 1·0, Greenwich Mean Time.

Mean Longitude of *Iris*	.....	331	24	20·57	M.E. Aug. 1.
ϖ	.....	41	31	19·71	
Ω	.....	259	44	45·91	
i	.....	5	28	15·26	
φ	.....	13	19	59·98	
Log a	.....			0·3772589	
μ	.....			964″·091333	

"These elements represent the middle declination exactly, and give the right ascension too small by 0″·8. On comparing them with the latest observation which I have yet seen, viz. Professor Kaiser's on March 14, (published in a recent number of the Society's *Monthly Notices*), I find the following errors:—

$$\text{Cos.}\,\delta \times \Delta\alpha = -2''\cdot37 \qquad \Delta\delta = -5''\cdot11$$

"These differences being so very small, it appeared to me probable that any attempt to correct the orbit from a combination of the observations during the first apparition of *Iris* only, would hardly repay the trouble that must necessarily be expended upon it. I have therefore delayed the final investigation until after the next appearance of the planet. The two oppositions can then be connected, and the elements resulting from a discussion of all the observations will no doubt be sufficiently exact to form the basis for ephemerides for some time to come.

"Assuming, therefore, that the orbit just given applies to Greenwich mean noon of 1847, August 1, I have calculated the perturbations produced by *Venus*, the *Earth*, *Mars*, *Jupiter*, and *Saturn*, between this date and 1849, February 3, (nearly the epoch of opposition), employing the same values for the masses as are now adopted by Encke in his investigations on the comet which bears his name; their logarithms are,—

Venus	4·39595
Earth and Moon	4·44916
Mars	3·5718
Jupiter	6·97969
Saturn	6·45573

"The united effects of these planets, between 1847, August 1, and 1849, February 3, are,—

$$\int d\alpha = +0.00053771$$
$$\int de = +0.000302365$$
$$\int d\pi = +295''.282$$
$$\int dL = +146\ .486$$
$$\int d\Omega = -76\ .789$$
$$\int di = -7\ .232$$

"For the ephemeris subjoined the true elements were obtained for every 24th day, and interpolated with 4th differences, where sensible, for every 8th day. The geocentric places so obtained were interpolated with 4th differences for each day. For the sake of brevity the elements of the variable ellipse are here given for the extreme dates of the ephemeris only:—

	Aug. $7^d.0$	Nov. $11^d.0$
	° ′ ″	° ′ ″
M	29 28 26·64	55 9 7·09
π	41 35 29·24	41 36 55·13
Ω	259 45 41·02	259 45 51·44
i	5 28 14·30	5 28 11·39
φ	13 20 0·25	13 20 33·03
Log. μ	2·9841593	2·9840273

"The longitudes are referred to the apparent equinox of date; corrections being applied for diminution of obliquity, &c. The ephemeris contains the position of the planet, for the apparent equinox and equator of each date, unaffected with aberration; consequently, before comparing with apparent places, it will be necessary to subtract the time given in the last column from the mean time of observation.

Ephemeris.

At Greenwich Mean Noon.

1848.		R.A. ° ′ ″	Decl. ° ′ ″	Log. Δ	$497''.8 \times \Delta$ m s
August	7	104 51 34·7	+22 11 17·8	0·43794	22 44·6
	8	105 27 11·3	22 6 11·3		
	9	106 2 40·5	22 0 57·2	0·43679	22 40·9
	10	106 38 2·0	21 55 35·4		
	11	107 13 15·9	21 50 6·3	0·43560	22 37·2
	12	107 48 22·0	21 44 29·7		
	13	108 23 20·2	21 38 45·9	0·43437	22 33·4
	14	108 58 10·5	21 32 54·8		
	15	109 32 52·8	21 26 56·7	0·43310	22 29·4
	16	110 7 27·2	21 20 51·6		
	17	110 41 53·3	21 14 39·6	0·43178	22 25·3
	18	111 16 11·4	+21 8 20·8		

1848.		R.A.	Decl.	Log. Δ	497ˢ·8 × Δ
		h m s	° ′ ″		m s
August	19	7 26 1·0	+21 1 55·4	0·43042	22 21·1
	20	7 28 25·5	20 55 23·3		
	21	7 30 50·1	20 48 44·8	0·42900	22 16·7
	22	7 33 15·5	20 41 59·8		
	23	7 35 40·7	20 35 8·6	0·42755	22 12·3
	24	7 38 5·8	20 28 11·1		
	25	7 40 30·8	20 21 7·4	0·42604	22 7·7
	26	7 42 55·8	20 13 57·8		
	27	7 45 20·6	20 6 42·2	0·42448	22 2·9
	28	7 47 45·4	19 59 20·9		
	29	7 50 10·1	19 51 53·9	0·42288	21 58·0
	30	7 52 34·7	19 44 21·3		
	31	7 54 59·2	19 36 43·3	0·42122	21 53·0
Sept.	1	7 57 23·6	19 28 59·9		
	2	7 59 47·9	19 21 11·3	0·41951	21 47·9
	3	8 2 12·1	19 13 17·6		
	4	8 4 36·2	19 5 18·8	0·41775	21 42·6
	5	8 7 0·2	18 57 15·0		
	6	8 9 24·1	18 49 6·5	0·41594	21 37·2
	7	8 11 47·9	18 40 53·2		
	8	8 14 11·6	18 32 35·3	0·41407	21 31·6
	9	8 16 35·2	18 24 12·9		
	10	8 18 58·7	18 15 46·1	0·41215	21 25·6
	11	8 21 22·1	18 7 15·0		
	12	8 23 45·4	17 58 39·7	0·41017	21 20·0
	13	8 26 8·6	17 50 0·3		
	14	8 28 31·7	17 41 17·0	0·40814	21 14·0
	15	8 30 54·7	17 32 29·7		
	16	8 33 17·6	17 23 38·7	0·40605	21 7·9
	17	8 35 40·4	17 14 44·0		
	18	8 38 3·1	17 5 45·7	0·40390	21 1·7
	19	8 40 25·7	16 56 44·0		
	20	8 42 48·2	16 47 38·9	0·40170	20 55·3
	21	8 45 10·6	16 38 30·7		
	22	8 47 32·9	16 29 19·4	0·39944	20 48·8
	23	8 49 55·1	16 20 5·2		
	24	8 52 17·2	16 10 48·0	0·39712	20 42·1
	25	8 54 39·2	16 1 28·1		
	26	8 57 1·1	15 52 5·5	0·39473	20 35·3
	27	8 59 22·9	15 42 40·3		
	28	9 1 44·6	15 33 12·8	0·39229	20 28·4
	29	9 4 6·2	15 24 42·9		
	30	9 6 27·7	15 14 10·9	0·38978	20 21·3
Oct.	1	9 8 49·1	+15 4 36·9		

1848.		R.A.	Decl.	Log. Δ	497ˢ·8 × Δ
		h m s	° ′ ″		m s
Oct.	2	134 17 44·0	+14 55 0·9	0·38720	20 14·1
	3	134 44 26·3	14 45 23·2		
	4	135 10 56·9	14 35 43·7	0·38456	20 6·7
	5	135 37 16·0	14 26 2·6		
	6	136 3 23·2	14 16 20·1	0·38187	19 59·7
	7	136 29 18·8	14 6 36·1		
	8	136 55 2·6	13 56 50·9	0·37910	19 51·7
	9	137 20 34·5	13 47 4·5		
	10	137 45 54·4	13 37 17·0	0·37628	19 43·9
	11	138 11 2·4	13 27 28·5		
	12	138 35 58·3	13 17 39·2	0·37339	19 36·1
	13	139 0 42·1	13 7 49·2		
	14	139 25 13·6	12 57 58·6	0·37044	19 28·1
	15	139 49 32·8	12 48 7·5		
	16	140 13 39·5	12 38 16·1	0·36741	19 20·0
	17	141 37 33·6	12 28 24·4		
	18	141 1 15·0	12 18 32·5	0·36432	19 11·8
	19	141 24 43·6	12 8 40·5		
	20	141 47 59·4	11 58 48·6	0·36117	19 3·5
	21	142 11 2·0	11 48 56·9		
	22	142 33 51·4	11 39 5·5	0·35795	18 55·0
	23	142 56 27·4	11 29 14·7		
	24	143 18 50·0	11 19 24·3	0·35465	18 46·4
	25	143 40 58·9	11 9 34·9		
	26	144 2 54·0	10 59 46·1	0·35129	18 37·7
	27	144 24 35·1	10 49 58·4		
	28	144 46 2·0	10 40 11·8	0·34785	18 28·9
	29	145 7 14·6	10 30 26·5		
	30	145 28 12·7	10 20 42·5	0·34436	18 20·0
	31	145 48 56·3	10 11 0·0		
Nov.	1	146 9 25·1	10 1 19·2	0·34079	18 11·0
	2	146 29 39·1	9 51 40·1		
	3	146 49 38·1	9 42 2·8	0·33716	18 2·0
	4	147 9 22·0	9 32 27·5		
	5	147 28 50·5	9 22 54·2	0·33346	18 52·8
	6	147 48 3·7	9 13 23·2		
	7	148 7 1·3	9 3 54·5	0·32970	17 43·6
	8	148 25 43·2	8 54 28·4		
	9	148 44 9·2	8 45 4·9	0·32587	17 34·2
	10	149 2 19·2	8 35 44·3		
	11	149 20 13·1	+8 26 26·4	0·32197	17 24·8